From User Experience to Sustainable Action: A Systemic Intervention Against Food Waste

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***Abstract*: This study examines food waste in the company canteen of COFICAB, a Tunisian automotive cable manufacturing company, which serves many meals a day and generates a considerable amount of daily food waste. A hybrid methodology combining systems analysis [15] and Design Thinking [14] identified a main positive loop ('food waste loop'): inadequate planning, unsuitable menus, low satisfaction, high leftovers with no follow-up, increasing inefficiencies. Three positive secondary loops - waiting time (15 min), disengagement and non-use (no sorting, 13,785 kg/year not used) - compound the problem. The data, collected from 4 December 2024 to 13 January 2025 via one, three-day observations and interviews (management, service provider, HR, CSR, purchasing), reveal structural challenges: a strong majority is asking for more variety, and standardised portions are causing dissatisfaction. Three solutions were proposed: KOOLWISE, an application for participative planning; systemic composting; and Green Challenge, a gamification system to encourage sorting and eco-responsible behaviour. These solutions reduce waste, improve the user experience and support MDGs 12, 13 and 3. Despite limitations (specific sample, short collection period), this innovative framework is replicable. It is recommended that future research should utilise the Internet of Things (IoT) and longitudinal studies.**

***Keywords*— Food waste, sustainable management, company canteens, systemic approach, Design Thinking.**

I. INTRODUCTION

The following text constitutes the introduction to the present study. The issue of food waste represents a significant environmental concern in the contemporary era. According to the Food and Agriculture Organization of the United Nations, 1.3 billion tonnes of food are wasted annually [1]. In professional contexts, company canteens, despite the intention to promote the well-being and productivity of employees, contribute significantly to the amplification of this problem by adopting a process that has been described as inefficient. One of the companies that has committed itself to the task of overcoming this obstacle is the Tunisian company COFICAB, a global leader specialising in the manufacture of automotive cables. The central issue for its canteen, which serves 130 to 400 meals a day (400 meals/day over 220 days, 130 meals/day during Ramadan, i.e. 250 days/year), is optimising the management of food waste while improving the experience of its employees.

On a global scale, research into the management of waste in corporate dining facilities is a subject of growing interest among researchers in a range of disciplines. Parfitt et al. [2] have analysed inefficiencies in food supply chains, such as inadequate planning, which contribute to waste. Papargyropoulou et al. [3] developed a precise hierarchy (prevention, elimination) for the utilisation of waste, yet company canteens were not a target of this study. Hamari et al. [4] have provided a robust validation of the efficacy of gamification in promoting sustainable behaviour, thus offering a promising avenue for the development of engaging solutions. Silvennoinen et al. [5] and Eriksson et al. [6] estimated that 20-30% of waste originates from non-personalised menus, a problem that has been observed at COFICAB. Gunawan et al. [7] have explored the management of urban organic waste with a view to proposing solutions, including the optimisation of collection. As posited by the Ellen MacArthur Foundation [8] and Ouro-Salim et al. [9], the importance of the circular economy has been emphasised, with the promotion of approaches such as composting. The United Nations Development Programme (UNDP) has conducted research on solid waste management in Mwanza, Tanzania, emphasising collaborative strategies. Cai et al. [11] have advocated for the utilisation of digital tools to enhance the efficacy of planning processes. On a global scale, research into the management of waste in corporate dining facilities is a subject of growing interest among researchers in a

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This study adopts a hybrid methodology combining design thinking and a systems approach to analyse malfunctions in the COFICAB canteen. This combination enables us to analyse structural interactions alongside the user experience. It is important to note that previous research in Mwanza and Depok also combined Design Thinking and the systems approach, but did not focus on company canteens. In the poorly documented context of Tunisia, this offers an integrated interpretation of the problem and directs the design of solutions towards coherent proposals based on real practices. It also enables us to contribute to the achievement of SDGs 12, 13 and 3.

II. METHODOLOGY

As previously announced, we opted for a methodological approach combining the systemic approach and Design Thinking. This has enabled us to unravel the complex interactions between the identified stakeholders and design solutions that meet users' needs. This section presents details of our approach, the tools used, the sampling method, justification for our methodological choices, and data analysis methods.

A. Hybrid approach

A systemic analysis was applied to model the canteen as a dynamic system comprising players (employees, management and the service provider), resources (ingredients and equipment) and processes (planning, service and waste management). This enabled feedback loops to be identified. For instance, menu planning that does not align with employee preferences can result in overproduction, leading to increased waste and costs and forming a positive feedback loop. Conversely, Design Thinking guided the evolution of the solution design from the empathy phase to the prototyping phase (testing the solution) [14]. This combination of methods enabled us to gain a deeper understanding of the systemic dynamics influencing canteen management and, above all, to progress to designing complementary, contextualised solutions.

B. Tools used

Four tools were used to collect the data. Each tool brought a unique perspective to the problem being addressed.

Direct observation: On-site observations were carried out. The aim was to monitor and focus on user flows, the organisation of the space and operational practices, both those of the service provider's staff and those of the employees. These observations enabled us to identify concrete problems such as the lack of waste sorting and long waiting times.

Semi-structured interviews: Empathic interviews were conducted with management, purchasing and human resources managers, employees and staff working in the canteen. They were guided by a specially prepared questionnaire exploring everything to do with meal management.

Immersion: All the members of the project team took part in the canteen meal experience. They experienced the same conditions as the employees (timetables, waiting in line, standardised service). This activity considerably enriched the team's understanding of the challenges faced on a daily basis, such as time pressure and unsuitable portions, and above all it supplemented the observations with real-life experience.

Questionnaire: A questionnaire was distributed to a representative number of employees to collect opinions on meal quality, sorting practices and barriers to reducing food waste. The responses provided a qualitative and quantitative database that complemented and supported the observations and interviews.

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C. Sample and collection period

The study sample comprised 157 COFICAB employees. They represent a diverse population in terms of gender (71.97% men, 28.03% women), age (38.22% between 26-35 years, 28.66% between 36-45 years), and seniority (39.49% between 1-5 years, 22.51% over 50 years). This sample reflects the demographics of the company, which is predominantly male and made up of middle-aged employees. The sample is therefore well representative for analysing eating habits. Data collection took place over six weeks, from 4 December 2024 to 15 January 2025.

Observations were carried out over 3 working days, with an average of 6 hours per day, covering the peak periods (12:00-14:00). The interviews were conducted over a single day. The company's CSR department was responsible for organising these meetings with the staff concerned and guaranteeing their availability. The questionnaire was distributed progressively in two stages, the first via Google Forms, which concerned staff with professional emails, and the second via a member of the company's staff, who was responsible for asking the target audience the questions and ticking off the answers on a tablet.

D. Justification of the methodological choice

The choice of a hybrid approach combining systemic analysis and Design Thinking is based on several theoretical and practical considerations. Systemic analysis, by making it possible to model the interactions between the various players and processes, makes it easier to understand the complex dynamics of food waste, which are often overlooked in linear approaches [4]. For example, surpluses do not come from meal preparation alone, but also from a chain of interactions encompassing planning and user feedback. This approach identified the focal points of systemic action, such as the importance of coordination between management and the service provider in order to reduce waste.

As for Design Thinking, it was essential for the development of user-centred solutions. From the outset, by focusing on understanding and studying the needs of employees and considering feedback from the company's staff during the design and modelling phase of prototyping, the proposed solutions met the defined needs. Thanks to this combination of quantitative and qualitative approaches, our hybrid methodology offers a robust and actionable analysis.

E. Data analysis

To analyse the data, we used qualitative and quantitative approaches to triangulate and consolidate the results.

For the questionnaires, statistical analysis was carried out using Microsoft Excel, the MCQs were converted into percentages, while the open-ended questions were manually coded to identify repetitive themes. We also carried out cross-analyses to explore variations in relation to age, gender and seniority. For example, employees with more than 10 years' seniority expressed greater dissatisfaction (75% described the dishes as unsuitable). These analyses made it possible to measure the scale of the problems and identify priorities for action.

The observations and interviews were processed and analysed manually using a thematic coding process. Three themes were classified on the basis of the observations, namely spatial organisation (e.g. lack of waste sorting), user flows (e.g. waiting times) and operational practices (e.g. non self-service). The interviews identified five main themes: planning that lacks structure, little feedback that can be almost non-existent, almost total delegation to the service provider, excessive concerns about hygiene and positive assessments of practicality. The team agreed on these themes to minimise interpretation bias.

For modelling and systemic analysis, two types of maps were used. Firstly, we used a flow diagram to map all the successive stages involved in the canteen dining experience. After that, several causal diagrams were drawn up covering the main feedback loop and other secondary loops.

III. RESULTS

The information collected between 4 December 2024 and 13 January 2025, using all the qualitative and quantitative tools mentioned above, has enabled us to understand the reasons for and dynamics of food waste in the canteen. The canteen, which is active on a daily basis, generates around 70 kg of food waste per day (13,785 kg/year), with environmental, economic (management costs) and social (employees' disconnection

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from sustainability issues) effects. This section presents the results in four sections: results of the questionnaire, observations and interviews, systemic analysis and mapping of the user experience.

A. Results of the questionnaire

The questionnaire, which was sent to 157 employees, collected demographic data, eating habits and opinions about the canteen. The responses included cross-analyses by gender, age and seniority to identify variations. The key results are summarised in Table -1.

TABLE I

KEY RESULTS FROM THE COFICAB CANTEEN QUESTIONNAIRE

Question	Overall Result (%)	By Group
Satisfaction with meal quality	24.20 (satisfactory)	15.93% (men), 43.18% (women)
Suitable portion sizes	57,32 (satisfactory)	44,44 % (36–45 years)
Menus suited to tastes	22.93 (yes, often)	16,67 % (26–35 years)
Finishing the meal	14,01 (always)	8,57 % (>10 years seniority)
Waiting time too long	70,06 (sometimes/often)	75,56 % (36–45 years)
Interest in greater variety	87,26	90,00 % (< 25 years)

Profile of respondents: The sample comprises 71.97% men (113) and 28.03% women (44), with 38.22% (60) aged 26-35 and 39.49% (62) with 1-5 years' seniority. These demographics ensure that the entire COFICAB workforce (around 800 people) is adequately represented.

Attendance and motivations: 38.22% (60) attend the canteen every day, 29.94% (47) 2-4 times a week, 9.55% (15) less than 2 times, and 22.29% (35) rarely. Convenience (proximity, time saving) was the main reason for 82.17% (129), followed by affordability (31.21%, 49) and quality/variety (9.55%, 15). Of the 28.66% (45) bringing their own meals, 57.78% (26) cited personal preferences, 22.22% (10) the poor quality/taste of the meals, and 20.00% (9) saving time or money.

Evaluation of meals: Only 24.20% (38) rated the quality as satisfactory, 71.97% (113) as average, and 3.82% (6) as unsatisfactory (via comments). Women were more satisfied (43.18%) than men (15.93%). Portions were satisfactory for 57.32% (90), insufficient for 29.30% (46), and too large for 13.38% (21), particularly in the 36-45 age group (44.44% satisfied). The menus meet the tastes of 22.93% (36) ‘most of the time’, but 62.42% (98) say ‘not really’ and 14.65% (23) ‘rarely’, with the 26-35 age group being less satisfied (16.67%). Only 14.01% (22) always finish their meal; of the remaining 135, 73.33% (99) cite an inappropriate taste, 14.07% (19) a lack of time, 8.89% (12) overly large portions, and 8.15% (11) dietary restrictions (allergies, diets).

Desired improvements: 87.26% (137) want more variety, 15.29% (24) gluten-free options, and 8.92% (14) vegetarian meals. Young people (< 25 years) are particularly keen on variety (90.00%). 65.61% (103) would like to see changes to the service, including 58.25% (60) for more variety, 19.42% (20) for quality/taste, and 14.56% (15) to reduce waiting times.

Atmosphere and service : 58.60% (92) rated the atmosphere as good, 22.29% (35) as pleasant, and 19.11% (30) as noisy/uncomfortable. The preferred times are 12.00-13.00 (61.15%, 96) and 13.00-14.00 (25.48%, 40). Waiting time was a problem, with 70.06% (110) finding it too long (39.49% sometimes, 30.57% often), especially in the 36-45 age group (75.56%). Hygiene was very satisfactory for 10.83% (17), satisfactory for 51.59% (81), average for 29.94% (47), and unsatisfactory for 7.64% (12).

B. Observations and interviews

Observations: Carried out over three days (18 hours) during peak full stops (12.00-14.00), the observations covered user flows, spatial organisation and operational practices. The time taken for an employee to settle down and start eating reached up to 15 minutes at peak times (1pm-1.30pm), confirming the dissatisfaction

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associated with waiting. Off-peak, the flow is calm, with quality furniture and lighting contributing to a pleasant atmosphere (22.29%). Non-self-service means there is a limited choice (e.g. salad, schnitzel/fish) and adjustments can be made to quantities, but the standardised portions explain why 13.38% found the portions too large and 29.30% thought they were too small. The absence of selective sorting bins in the canteen and kitchen indicates a lack of infrastructure and equipment for the sustainable management of waste, made up of food, cardboard and metals. The kitchen, which is well equipped and complies with international standards, supports the 62.42% satisfied with hygiene.

Interviews: The interviews, conducted with management, the service provider, HR, the CSR department and the purchasing department, explored the management of the canteen, the perceptions and the priorities of the stakeholders.

- Management (Tunisia Country Director): The new canteen, built two years ago, aims to offer healthy and affordable meals (15% of the actual cost) for the well-being of the 130 to 400 employees per day, in the absence of local alternatives. This initiative, aligned with the company's health-focused culture, is appreciated for its practicality (82.17%) and affordability (31.21%) as the main motivations. Management stresses the importance of the canteen for employee satisfaction and loyalty. It is also important to note that the first canteen was built twenty years ago, and that the new one is part of a continuing quest for employee well-being and comfort. Management also insists on extending the relevant solutions to all their sites, whether in Tunisia or elsewhere.

- Service provider: The selection of suppliers is based on recognised brands with hygiene certifications, favouring fresh and local products. Cold rooms ensure a weekly supply, supporting the quality of meals (24.20% satisfied). However, menu planning lacks structure: only one survey has been carried out since the new canteen opened, and the menus, designed without regular consultation, ignore specific preferences (e.g. vegetarian, allergies). This inadequate planning, marginally influenced by HR, results in surpluses and waste (70 kg/day), confirming the majority's assessment that the menus are unsuitable and that most people do not finish their meal. Hygiene procedures are strict, with regular training and occasional checks by COFICAB, in line with the 62.42% satisfied with hygiene. No formal feedback system exists; informal feedback has only led to minor adjustments.

- Human Resources (HR): The Human Resources department, represented by its director, plays an important role in defining how the canteen operates. He expressed the importance of maintaining a healthy and nutritious quality of meal, as well as insisting on compliance with international standards in the operation of the canteen. However, he acknowledged that there was still room for improvement in terms of the variety and planning of meals.

- CSR department: The CSR department, which was involved in the discussions, prioritises waste reduction to bring the canteen into line with sustainability objectives. Although the company's general policy is oriented towards the use of clean energy (photovoltaic) and the promotion of the circular economy, the CSR department believes that it is essential that all the canteen's operations, as well as its social and environmental impact, are on the same track, prioritising a healthy environment and eco-responsible behaviour.

- Purchasing department: It pays particular attention to the quality and origin of all food products used in the preparation of meals in the canteen. All food is supplied by major certified suppliers recognised for the quality and consistency of their products. Although the purchasing department does not directly supervise the procurement of food, as this responsibility lies with the service provider, it nevertheless coordinates logistics and regularly monitors the processes and logistical resources made available to the service provider in order to guarantee healthy, high-quality food.

C. Systemic analysis

The analysis inspired by Meadows [15] identified a main positive loop (‘food waste loop’). Due to space constraints in the article and the specificities of the image format to be integrated, we have modelled only the main loop, while the secondary loops ‘Non-value’, ‘Waiting time’ and ‘Disengagement’ are not, although they have been detected.

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Fig. 1 Feedback loops - Food waste

Main loop (food waste), Positive (reinforcement):

Inadequate meal planning → Meals not adapted to preferences → Lower satisfaction/consumption → Large food leftovers → Increased food waste → Lack of monitoring → Even less effective planning.

Confirmed by:

- Planning without consultation (interviews, provider: one survey since the inauguration of the new canteen).
- the majority find the menus unsuitable, most do not finish their meal for reasons of taste (questionnaire).
- A minority were satisfied with the quality, while a large majority asked for more variety.
- Lack of structured feedback (interviews), perpetuating the cycle.

Secondary loops identified but not modelled:

- Waiting time: Massive flow → high wait (15 min) → frustration → less consumption → leftovers → waste. Feeds the main loop via leftovers (a majority dissatisfied with the wait, observations, questionnaire).
- User disengagement: Perceived quality → dissatisfaction (71.97% average quality) → low attendance (22.29% rarely) → imprecise planning → overproduction → leftovers. Contributes to inadequate planning.
- Non-recovery of waste: No sorting → waste not recovered → no return → no adjustment → planning errors. Aggravates inefficiency (observations, CSR).

TABLE 2

CHARACTERISTICS OF IDENTIFIED LOOPS

Loop	Type	Key Variables	Impact
Main (food waste)	Positive	Planning, satisfaction, leftovers, monitoring	Increases waste
Secondary (waiting time)	Positive	Flow, waiting, frustration, leftovers	Increases leftovers
Secondary (user disengagement)	Positive	Quality, satisfaction, attendance, overproduction	Worsens planning
Secondary (lack of waste recovery)	Positive	Sorting, recovery, adjustment	Perpetuates losses

D. Mapping the user experience

The mapping, inspired by Brown [14], uses the questionnaire, observations and interviews to describe five stages in the user experience, illustrated in Figure -2 and summarised in Table -3.

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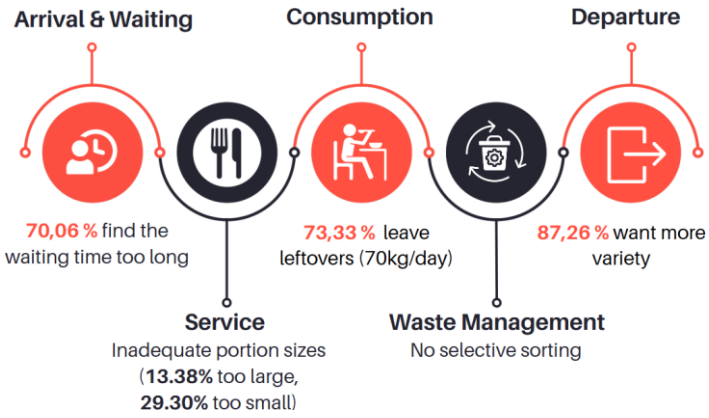

Fig. 2 Mapping the user experience

1- Arrival and waiting : Delays of up to 15 minutes at peak times (12:00-13:00, 61.15%).

2- Service: Non-self-service with limited choice (salad, schnitzel/fish), but standardised portions (13.38% too much, 29.30% too little).

3- Consumption: a minority, no more than 25% of those questioned, expressed satisfaction.

4- Management of leftovers : Lack of selective sorting, preventing recovery

5- Departure: a majority assess the menus as inadequate, reflecting a negative experience.

TABLE 3

PAIN POINTS IN THE USER EXPERIENCE

Step	Observed Issue	Impact on the User
Waiting	Delays up to 15 minutes (70.06%)	Frustration, time pressure
Service	Standardised portions	Dissatisfaction (13.38%, 29.30%)
Consumption	73.33% do not finish their meals (taste)	Waste (70 kg/day)
Waste Management	Lack of selective sorting	Unsustainable behaviours
Departure	87.26% want more variety	Negative experience

IV. DISCUSSION

This section discusses the results of the study of food waste in the COFICAB canteen, comparing them with the literature, exploring their various implications and identifying limitations and recommendations for future research.

A. Comparison with the literature

The main waste loop, caused by inadequate menu planning, aligns with Parfitt et al [2], who identify ineffective planning as a key driver of waste in food chains. A majority of employees do not finish their meals for reasons of taste and a large proportion consider the menus to be unsuitable reaffirm Silvennoinen et al [5], estimating that 20-30% of catering waste comes from non-personalised menus. Low satisfaction with a high demand for variety echoes Ben Ismail et al [12], noting similar challenges in Tunisian university canteens, although their operational solutions limit the systemic approach.

The secondary loop of waiting time supports Thi et al [16], linking logistical inefficiencies to surpluses in canteens in developing countries. a majority dissatisfied with waiting times at COFICAB confirms this dynamic. The loop of employee disengagement mirrors Eriksson et al [6], linking dissatisfaction to irregular attendance, complicating planning. The waste non-use loop is consistent with SWEEPNET [13], which

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criticises the lack of selective sorting in Tunisia, but their general recommendations (e.g. raising awareness) lack specificity for company canteens. The proposed solutions are inspired by the literature. KOOLWISE, which enables participatory planning, is based on Cai et al [11], who praise digital tools for reducing surpluses. Systemic composting follows Ouro-Salim et al [9] and the Ellen MacArthur Foundation [8], promoting the circular economy. Green Challenge, through gamification, aligns with Hamari et al. [4], validating its effectiveness in encouraging sustainable behaviour. Compared to conventional solutions (menu adjustments, awareness raising) proposed by Ben Ismail et al. [12] or SWEEPNET [13], these proposals incorporate a systemic and user-centred approach that better responds to the complex dynamics of COFICAB.

B. Implications

Theoretical: The hybrid approach combining systemic analysis [15] and Design Thinking [14] enriches and consolidates the literature on food waste by modelling complex positive loops, which have been little explored in Tunisian company canteens. It integrates interactions between actors (management, service providers, employees) and processes (planning, service, waste management), while prioritising the user experience. This approach supports SDGs 12 (responsible consumption), 13 (climate action) and 3 (health and well-being).

Practices: The proposed solutions target the identified points of friction. KOOLWISE responds to the demand for variety and specific needs (15.29% gluten-free, 8.92% vegetarian), reducing leftovers and waiting times through optimised planning. Systemic composting reduces management costs and environmental impact, bringing the canteen into line with CSR objectives. Green Challenge engages employees (65.61% want change) in eco-responsible practices, strengthening the corporate culture.

Socio-cultural: The solutions promote behavioural change. Green Challenge, through gamification, raises awareness of waste sorting and reduction, compensating for employees' disconnect from sustainability issues (lack of sorting, section III.2). Composting, which recycles waste for green spaces, reinforces circular economy practices in COFICAB's culture. Training in sorting and hygiene is crucial to maintaining these changes, especially in Tunisia, where eco-responsible practices are underdeveloped [13].

C. Limitations and recommendations

Limitations: The sample (157 employees) is specific to COFICAB, which limits generalisation to other canteens. The six-week collection period (December 2024-January 2025) excludes seasonal variations, such as Ramadan (130 meals/day vs. 400 normally). Quantitative data on waste (70 kg/day) are estimated, without precise metric data per meal or per day. The lack of structured feedback limits the evaluation of past adjustments.

Recommendations:

- Future research: Use the IoT to quantify waste in real time [17] and conduct longitudinal studies to determine seasonal variations.
- Methodology: Expand the sample (other COFICAB sites) and conduct in-depth interviews with HR/CSR/purchasing for even richer qualitative data.
- Practice: Train employees on SDGs, food sorting, eco-responsible behaviour and hygiene to support composting and the Green Challenge.

V. PROPOSED SOLUTIONS

Based on the results, three solutions are proposed to reduce food waste, improve the user experience, and align the canteen with COFICAB's CSR objectives.

A. KOOLWISE

KOOLWISE is a mobile app designed specifically for the COFICAB canteen. It allows employees to pre-order their meals based on their preferences, diet, and schedule. It offers two menus per day, with a choice of four categories: standard, healthy, cardiovascular health-friendly, and specific diets (gluten-free, vegetarian, etc.). These features respond to employee requests for more variety and help reduce leftovers from uneaten meals.

In addition, KOOLWISE incorporates an instant feedback system that allows users to rate their meals, suggest improvements, and report non-compliance. This feedback is collected and forwarded to the service

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provider, breaking the lack of follow-up observed in the waste cycle. The app also records meal collection times, which helps to reduce queues at peak times (12:00–13:00), improving the service experience for users who are dissatisfied with waiting times.

B. Systemic composting

The second solution involves implementing a composting system integrated into the catering chain. It includes:

- Recycling bins located at the restaurant exit, identifiable by colour coding and educational pictograms.
- A smart composting machine, calibrated according to daily waste production, equipped with an automatic weighing and memory system. This system records the amount of waste entering the machine on a daily basis and compares it to the amount of compost produced.

This monitoring system makes it possible to assess the impact of the KOOLWISE solution and the Green Challenge on employee behaviour and the overall performance of the canteen. Part of the compost produced (estimated at 5,514 kg/year) is used to feed the 800 plants at the COFICAB site, spread over 25 hectares, improving the company's green ecosystem. Another part is reserved for a company in the same group, specialising in strawberry cultivation. Pretests have validated the compatibility of the compost from canteen waste with the nutritional needs of this crop, thus creating a virtuous circle within the group and sustainable agricultural value.

C. Green Challenge

Green Challenge is a gamification initiative using an 'EcoPoints' system to encourage selective sorting and food waste reduction. Employees earn points for specific actions, such as sorting their waste correctly, finishing their meals, walking 500 metres after lunch or indicating their preferences via KOOLWISE. These points are recorded in an app and on a physical scoreboard, with monthly rankings and rewards such as vouchers or extra days off. This initiative engages the 65.61% of employees who want to see changes in the service and addresses low satisfaction by making the canteen experience more interactive. By raising awareness of eco-friendly practices, Green Challenge closes the waste recovery loop, where the lack of sorting exacerbates losses. Training workshops will accompany the launch to explain sorting and environmental objectives, reinforcing employee involvement. This playful approach is inspired by the literature on gamification [4], validating its effectiveness in encouraging sustainable behaviour, and supports COFICAB's corporate culture focused on well-being and social responsibility.

VI. CONCLUSION

This study reveals a positive loop of food waste in the COFICAB canteen, amplified by inadequate planning, unsuitable menus and a lack of monitoring, generating significant daily food waste. Secondary positive loops (waiting times, disengagement, lack of value) exacerbate these dynamics, fuelled by excessive expectations, low attendance (22.29%) and a lack of sorting. Dissatisfaction (a majority want more variety, 71.97% average quality) highlights structural challenges. KOOLWISE, composting and Green Challenge break these loops, reduce waste, improve the user experience and align the canteen with SDGs 12/13. Despite limitations (specific sample, estimates), the hybrid approach (systemic and Design Thinking) offers an innovative framework. Future research with IoT and structured feedback is recommended to sustain the results.

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